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PB 131632-52

# INFORMATION ON SOVIET BLOC INTERNATIONAL GEOPHYSICAL COOPERATION — 1959

February 6, 1959

U. S. DEPARTMENT OF COMMERCE
Office of Technical Services
Washington 25, D. C.

Published Weekly
Subscription Price $12.00 for the Series

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This report contains unevaluated information on Soviet Bloc International Geophysical Cooperation selected from foreign-language publications as indicated in parentheses. It is published as an aid to United States Government research.

# INFORMATION ON SOVIET BLOC INTERNATIONAL GEOPHYSICAL COOPERATION

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Approved For Release 1999/09/08 : CIA-RDP82-00141R000200530001-4

# I. GENERAL

## Book Lists Soviet Scientists Predictions for 21st Century

A Moscow datelined article appearing in the 16 January issue of the Italian newspaper L'Unita reviews a new book just issued by the publishing house Sovetskaya Rossiya. The book, Report on the 21st Century, contains a series of articles by 29 leading Soviet scientists on scientific achievements which can be expected in the coming century.

The article contains excerpts of some of the statements, covering a wide range of subjects.

Yuri Khlebtsevich, author of various astronautical theories, predicts that flights to the Moon and return will be commonplace by the end of the 20th Century. By the 21st Century, the Moon will become, so to speak, the seventh continent of our planet, and the exploitation of its natural resources will be in progress. The next generation of scientists must study the geology and meteorology of the Moon and Mars and conduct research on the physics of Venus' seas. Attempts to reach the planets of Saturn, Jupiter, Uranus, and Pluto with radio-controlled rockets will be made at the beginning of the 21st Century.

The launching of sondes into cosmic space has already begun. The time is not far off when a manned lunar scientific station will be built. But first, in all probability, a mobile laboratory controlled by radio from the Earth will be used. Traveling over the surface of the Moon, this station will continuously transmit television pictures of the adjacent territory, conduct research on the soil, temperature, and atmosphere of the Moon. A similar laboratory could also be sent to Mars.

Academician V. A. Kotel'nikov, director of the Institute of Radio Engineering and Electronics, Academy of Sciences USSR, foresees the development of radio engineering to the point where it will be possible to transmit sufficient energy through a beam of high-frequency oscillations to operate airplane motors. A similar beam might be used as a means of deflecting meteorites from the path of a space craft; in a matter of seconds it would disintegrate the meteoritic substance.

Lev Tenkevich, Corresponding Member and president of the Committee on Oceanography, Academy of Sciences USSR, says that the 21st Century will see the growth of a new science, that of submarine agronomy, or submarine genetics. Tenkevich bases his statement on the fact that the ocean is much richer in nutritive substances than the Earth. The biological efficiency of marine plants is equal to about 100 percent while that of arboreous plants is not more than 5-6 percent. Man has hardly touched the oceans' resources.

N. Varvarov, astronautics specialist, says that glass cities with artificial atmosphere will rise on the planets of the solar system. These will have to furnish all the substance needed by the living organism.

The first glass city will naturally appear on the Moon. The lunar craters seem to be predisposed by nature for the construction of this city. An intermediate provisioning station for cosmic craft will be built there. ("Report on the Year 2,000"; Rome, L'Unita, 16 Jan 59, p 8)

## II. ROCKETS AND ARTIFICIAL EARTH SATELLITES

### Photograph of Artificial Comet; Soviet Scientist Reveals Details

A photograph, claiming to show the artificial comet, taken on 3 January 1959 at 0356:20 hours Moscow time at the Mountain Station of the Main Astronomical Observatory of the Academy of Sciences USSR, near Kislovodsk, by M. N. Gnevyshev, chief of the station, appears in 18 January Pravda. The caption states that inasmuch as an interference light filter was used, the weak stars surrounding the artificial comet were not registered on the photograph. The determination of the artificial comet's location with respect to the stars, necessary for obtaining its precise coordinates, was made with the aid of special reference marks.

A photograph of the camera which took the picture and a schematic map of the region of the sky where the artificial comet was formed are also shown.

I. S. Shklovskiy, Doctor of Physicomathematical Sciences, gives the following information on the artificial comet in an article accompanying the photographs.

The possibility of observing the location of a cosmic rocket in space is necessary for the determination of its orbit. In principal, this problem can be solved by two methods, radiophysical and optical. The first (radiophysical) method makes it possible to determine the distance to the rocket with great accuracy, and with less accuracy to determine its angular coordinates in the celestial sphere. The processing of a large quantity of like observations makes it possible with sufficient accuracy to determine the orbit of the cosmic rocket.

The other, more "customary," method for astronomers for solving the same problem is the optical. However, optical observations of a cosmic rocket are accompanied by marked difficulties. The fact is that the solar

rays reflecting from a cosmic rocket at very great distances from the Earth will appear as a very weak star. The following example reveals how greatly the brightness of a rocket decreases with distance. Sputnik III, at a distance of 300 kilometers from the observer, was seen as a star of the 4th magnitude. If the distance were increased to 300,000 kilometers, that is, a thousand times farther, the flow of sunlight reflected from it (which is inversely proportional to the square of the distance) drops to a millionth. This means that the satellite would appear as a star of the 19th magnitude. At a distance of 100,000 kilometers from the Earth, the stellar value of the satellite would be about 16.5. It is possible to calculate the expected brightness of a rocket while it moves through space. At a distance of 100,000 kilometers from the Earth a rocket has a brightness weaker than the 14th stellar magnitude.

The difficulty is seen to be even greater when it is realized that the cosmic rocket must be observed against a rather bright sky background, as it would be near the Moon in its last quarter. Observations would only be possible with the very large telescopes found in only the largest observatories.. However, the realization of such observations meets with a number of specific difficulties connected with photographing weak objects using instruments having a small field of view under bright sky conditions.

In these circumstances, the necessity of developing a method of increasing the brightness of the cosmic rocket by many times, if only for a short time, arose. The idea for this method was prompted by nature itself through observations of comets whose brightness in some cases far exceeds that of stars. This brightness is the result of the capacity of gases associated with the comets to cause intense scattering of sunlight in separate spectral lines and bands. The bright yellow line of sodium is sometimes observed in their spectra.

Calculations showed that the mass of gas necessary for a comet to be visible to the naked eye at a distance of 100,000 kilometers is one kilogram. It followed that if the cosmic rocket ejected even a small quantity of vapor from some suitable substance it could be observed. The substance selected was sodium because of it characteristic bright yellow line. Calculations showed that the cloud of vapor from a mass of one kilogram of sodium at a distance of 100,000 kilometers from the Earth would be observed as an object of about the 6th stellar magnitude. This magnitude is the limit for unaided visual observations on a moonless night.

A great advantage of the sodium cloud is that it scatters light strictly according to a wave length of 0.589 microns (the yellow-orange part of the spectrum). This makes it possible, by using suitable light filters, to conduct observations of the sodium cloud even if it is projected against a rather bright sky background. Such light filters decrease the brightness of sky background intensely, while scarcely weakening the radiation of the sodium cloud.





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A similar "comet" was created by the Soviet cosmic rocket. In creating the comet, it was necessary to ensure, in a short period of time, the vaporization of sodium into its atomic state, since its molecules, its compounds, and also its ions, do not possess the capability to intensively scatter sunlight. The vaporizer for forming the cloud of atomic sodium produces the vaporization of the sodium with the aid of thermite, which is ignited at a predetermined moment by a programming device.

Preliminary testing of the vaporizer's operation was done with high altitude geophysical rockets. Sodium was vaporized in one of these experiments, with a rocket which reached a height of 430 kilometers. A golden-orange cloud formed and slowly dispersed in the atmosphere. This cloud was visible over a very great part of the Soviet Union. Processing the measurements of the cloud's brightness made it possible to determine the number of vaporized sodium atoms, which proved to be rather close to that which can be theoretically expected in full vaporization. By analyzing the rate of dispersion of the sodium cloud, the density of the Earth's atmosphere at such a great altitude was determined with great accuracy. The obtained value of density was in close agreement with the value derived from the analysis of the braking of the artificial earth satellites. These values, as is known, were unexpectedly high.

US experiments on sodium vaporization in the atmosphere were begun in 1955. However, these were conducted at altitudes of 70-140 kilometers for studying the wind at these altitudes and the chemical reactions of gases in these atmospheric layers with sodium.

In contrast, the first experiment by Soviet scientists with the high-altitude geophysical rocket, conducted at the considerably higher altitude of 430 kilometers, led to substantially new results and made it possible for the first time to study phenomena in the conditions of a rarefied medium.

Another important part of the project in creating the artificial comet was the development and production of special cameras for conduction observations of the formation of the sodium cloud. For this purpose, two series of powerful cameras, photographic and electronotelescopic, were made. These cameras were equipped with high-quality light filters and were located in a number of points in the Soviet Union. When the cosmic rocket began its historic flight, a network of ground stations equipped with special apparatus was in a state of full preparedness. Precisely at the moment specified by the program -- 0356:20 on 3 January 1959, the artificial comet was created in several tenths of a second at the time when the rocket was at a height of 113,000 kilometers. The cloud of sodium vapors was one hundred kilometers in size. The best conditions for the observations were in Central Asia, in the Caucasus, and in the Crimea. Despite the fact that cloudy weather prevailed at the majority of the stations where the observations

were conducted, the artificial comet was successfully observed at different points. The obtained photographs make it possible to determine the angular coordinates of the cosmic rocket and to plot more precisely its trajectory.

There is no doubt, says Shklovskiy, that methods for creating an artificial comet will be improved in the future. Specific ways for this improvement have already been outlined.

The creation by Soviet scientists of an artificial comet reveals the very important possibility of tracking the interplanetary craft of the future by "tracings." It will thus be possible to observe them optically for very great distances. ("The Artificial Comet," by I. S. Shklovskiy, Doctor of Physicomathematical Sciences; Moscow, Pravda, 18 Jan 59, p 6)

## Soviets to Release Published Information on Sputniks in Early 1959

According to listings in Novyye Knigi, the weekly bibliographic bulletin of the Ministry of Culture USSR, two volumes presenting the results of Soviet artificial Earth satellite investigations will be released from the publishers in the first half of 1959. The complete citation as it appeared in the source is given as follows:

Iskusstvennyye sputniki Zemli (Artificial Earth Satellites), No 1. Results of investigations conducted with the aid of the first artificial Earth satellites. Publishing House of the Academy of Sciences USSR. Seven author's sheets; 5,000 copies; 5 rubles. Available in first quarter 1959.

Collection of articles in which the preliminary results of investigations of cosmic rays, atmospheric density, optical methods of observing the first two satellites, and the vital activity of the animal during satellite flight are given. For physicists, geophysicists, astronomers, and physiologists.

Iskusstvennyye sputniki Zemli (Artificial Earth Satellites), No 2. Results of scientific investigations obtained with the aid of Sputnik III. Publishing House of the Academy of Sciences USSR; 5.5 author's sheets; 10,000 copies; 4 rubles. Available 2d quarter 1959.

Collection of articles devoted to the results of physical, meteorological and astrophysical investigations conducted with the aid of Sputnik III and rockets. For geophysicists, meteorologists, astrophysicists and mechanics. (Novyye Knigi, No 51, 23 Dec 58, p 4-5)

Permanent Artificial Earth Satellites Predicted by Blagonravov

 Academician A. Blagonravov, writing in an article carried by the 1 January 1959 issue of Promyshlenno-Ekonomicheskaya Gazeta, says that... "the time is not far off when the transition to interplanetary rockets will be made." He also states that one of the prospects for the very near future will be the creation of permanent artificial earth satellites. ("The Satellite Continues in Flight," by Academician A. Blagonravov; Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 1 Jan 59, p 2) 

New Soviet Films on Conquest of Space

Several new films are being made in the Central Studio for Documentary Films and the Moscow Studio for Popular Science Films.

The first interplanetary flight of the Soviet cosmic rocket is reflected in the documentary films "Twentieth Century," "From the 20th to the 21st Congress of the Communist Party of the Soviet Union," and in the motion picture "Sputnik."

The film "Automats in the Cosmos" issued by the Moscow Studio of Popular Science Films, acquaints the viewer with the use of rockets for scientific investigations, with the automatic apparatus and instruments they carry, and the principles of their operation. The apparatus carried by Sputnik III is shown.

A film, "Four-legged Astronauts," shows how animals are conditioned for flights to great altitudes, how Soviet scientists study their condition and behaviour during the flights, and what conclusions can be drawn from this for the organization of interplanetary flights by man. Interesting material on the new science of cosmic medicine, and the study of the effect of cosmic conditions on the human organism are included.

Projected popular science films include "Power Station in the Cosmos," "How the Sputnik Speaks," and "Conquest of Space."

The picture "I Was a Sputnik of the Sun" is being completed by the Moscow Studio of Popular Science Films. ("Films on the Mastering of the Cosmos"; Moscow, Sovetskaya Aviatsiya, 8 Jan 59, p 4)

## III. UPPER ATMOSPHERE

Low Latitude Aurora, 21-22 January 1957

A strong magnetic storm began on 21 January 1957, and on the night of 21-22 January, an intensive aurora was observed over a considerable part of the USSR. According to reports, it was observed in Penza, Odessa, and Kishinev. Observations conducted near Moscow at the Zvenigorod Station of the Institute of Physics of the Atmosphere, Academy of Sciences USSR ($\phi = 51^{\circ}1'$, $L = 120^{\circ}3'$) are described. The aurora began at 0030 hours.

Spectra of the aurora were photographed at the station in the 4,650-6,600 angstrom range using SP-48 spectrographs on $D_H$ type film. Three consecutive exposures were made in the 5,850-6,600 angstrom range with exposure times of 10, 25, and 120 minutes; in the 4,650-5,850 angstrom range, two were made with exposure times of 35 and 120 minutes, beginning at 0105 hours. The spectrographs were aimed North at an angle of 25 degrees to the horizon, catching the diffused form of the aurora in its field of view.

The lines of atomic oxygen, nitrogen, hydrogen, and molecular nitrogen were determined in the obtained spectrum. In addition to the forbidden lines of atomic oxygen ($\lambda$ 5577, 6300 and 6364 Å), lines of rare transitions with energies in the upper levels up to 12.98 electron volts occur in the spectrum. The radiation of neutral atomic nitrogen is observed in the 6,482, 6,486 and 6,441 angstrom lines. Hydrogen emission is represented by the $H_\alpha$ line obtained in the magnetic horizon. From the first $N_2$ positive system it is possible to separate clearly the (6.3), (7.4), and (9.6) bands. The remainder create only a certain background increase. The first negative $N_2^+$ system of the (0.2) band 4,709 angstrom also is present. Doublet sodium lines are absent in all three spectra. The OI lines ($\lambda\lambda$ 5577 and 6364 Å) were obtained by great overexposures.

The determination of the $H_\alpha$ contour was greatly complicated by the (6.3) and (7.4) bands of the primary positive system. Assuming that the initial resolution of the main maximums of the band correspond to approximately two thirds the intensity of the maximums, the blending of the H contour was excluded. The semispace of the contour obtained corresponds to the velocity of the hydrogen corpuscles $v = \pm 500$ kilometers per second. The maximum intensity equals 28.4, and the intensity reduced to the semispace of the instrumental coutour (3Å), is equal to 73.5, which constitutes 0.7 of the intensity of $\lambda$ 6364 Å. The $H_\alpha$ N II $\lambda$ 5005Å and $N_2^+$ $\lambda$ 4709 Å lines are absent in the second spectrum. In the third spectrum, which was taken during continuous cloudiness, only the (OI) $\lambda$ 6300 and $\lambda$ 6364 Å lines occur. The intensity of the $\lambda$ 6364 Å line in this picture is equal to 6. ("The Low Latitude Aurora of 21-22 January 1957," by A. V. Mironov, V. S. Proludina and N. N. Shefov, Zvenigorod Scientific Station, Institute of the Physics of the Atmosphere, Academy of Sciences USSR; Moscow, Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, No 12, Dec 58, pp 1,513-1,516)

Inclined-Incidence and Reflection Ionosphere Sounding

The inclined-incidence and reflection method is a new and effective way of investigating the condition of ionosphere. The works of N. I. Kabanov, K. M. Kosikov, and others have shown that the method accurately reflects the actual picture of ionosphere distribution. This method provides valuable data which helps to improve the reliability of radio communication, especially communication with microwave frequencies. With the help of the inclined-incidence and reflection method it is possible to maintain control of radio-wave communication and to monitor the operating frequencies.

The essence of the method consists is measuring the backward scatter propagation produced by an inclined radio beam at the point of incidence with the ionosphere or the ground surface. If a receiver with cathode-ray scope is located in the vicinity of the transmitter, a series of scatter-reflected signals will be observed on the scope. The amplitude of scatter-reflected signals depends on the transmitter pulse-power, the gain factor of transmitting and receiving antennas, the scattering properties of the ionosphere or ground, the absorption of the ionosphere, the sensitivity of the receiver, and some other factors.

The article describes investigation of ionosphere inhomogeneities with the aid of the inclined-incidence and reflection sounding method. ("Certain Problems Related to Inclined-Incidence and Reflection Sounding of Ionosphere," by B. I. Osetrov, Moscow, Radiotekhnika, No 12, Dec 58, pp 3-10)

Soviets Install Radiotelescope at Ussuri in Far East

A radio telescope has been installed at the station in Ussuri of the Sun Service of the Far East Affiliate, Siberian Branch of the Academy of Sciences USSR. It will be used for the study of signals from the lower layers of the Sun's chromosphere. ("From Everywhere About Everything"; Moscow, Izvestiya, 11 Jan 59, p 4)

## IV. METEOROLOGY

Fluctuations of the Microstructural Characteristics of a Cloud

Numerous studies of cloud microstructures by the El'brus Expedition of the Institute of Applied Geophysics, Academy of Sciences USSR, showed that samples taken from a cloud differed considerably as to microstructural characteristics, concentration, water content and the specific profile of the drop. Detailed investigations were conducted by the expedition for an

explanation of the lack of uniformity of this phenomenon. The results of these measurements are described, and on the basis of statistical processing, it is shown that significant space-time fluctuations of transfer characteristics (one meter, one second) exist in clouds. The measurement of these characteristics, it is claimed, can be used to explain the connection of cloud microstructures with small scale macrostructures. ("Fluctuations of the Microstructural Characteristics of a Cloud," by L. M. Levin, Institute of Applied Geophysics, El'brus Expedition, Academy of Sciences USSR; Moscow, Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, No 12, Dec 58, pp 1510-1513)

Thermal Radiation of Carbon Dioxide in the Atmosphere

The transmission function of the atmosphere in the 15 micron carbon dioxide absorption band is determined on the basis of using present-day data. The function obtained is used for calculations of the thermal radiation of carbon dioxide to investigate its relationship to changes in the concentration of carbon dioxide and atmospheric stratification. It is shown that the relationship of changes to concentration can be practically disregarded. ("Thermal Radiation of Carbon Dioxide in the Atmosphere," by K. Ya. Kondrat'yev and L. I. Nedovesova, Leningrad State University, imeni A. A. Zhdanova; Moscow, Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, No 12, Dec 58, pp 1,470-1,476)

## V. SEISMOLOGY

World-Wide System for Determining Earth Crust Movements Proposed by East German Scientist

For the determination of the movement of the Earth's crust, an article by a member of the East German Chamber of Technology (KdT) and of the Leipzig Geodetic Service proposes the initiation of international cooperation in the preparation of a network of elevation determinations (preferably underground bench marks) in granite blocks where no relative vertical movements resulting from exogenic forces are to be expected. These points in the network should be several kilometers apart; regular, precise measurements of the differences in the elevations of these reference points should be plotted on charts, and overlays should be used to follow the course of changes in the differences in elevation. It is suggested that these measurements and comparisons be made at regular intervals over a long period of time and that geologists and geodesists collaborate in the development of new methods of plotting networks and of interpreting data so that the cyclic pattern of the vertical movements of the earth's crust may be discovered. ("Determining the Extent of Earth Crust Movements As the Task of Elevation Determination of High Accuracy," by H. Kretzschmar; Berlin, Vermessungstechnik, No 12, Dec 58, pp 273-277)

Determination of Boundary Velocities

A graphic method of determining boundary velocities based on observations of the system of two traveling transverse hodographs of refracted waves corresponding to one and the same refracting boundary is presented. Various systems of observations on the line of a transverse profile are described. Examples of determining boundary velocities are given. ("Determination of Boundary Velocities According to Transverse Hodograms of Refracted Waves. I.," By M. M. Radzhobov, Trest "Sredazneftegeofizika" [Central Asia Oil Geophysics Trust], Moscow, Izvestiya Adademii Nauk SSSR, Seriya Geofizicheskaya, No 12, Dec 58, pp 1,491-1,503)

Tripartite Studies on Wave Velocities

The methods and apparatus used in determining group velocities of Rayleigh waves and directions to the epicenters of earthquakes are described. Three adjacent stations in the Caucasus equipped with Kirnos three-component seismographs were selected for the experiment. ("Determination of Rayleigh Wave Velocities and Epicentral Directions According to Three Adjacent Stations," by Ye. F. Savarenskiy and Sh. S. Ragimov; Moscow, Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, No 12, Dec 58, pp 1,485-1,490)

## VI. OCEANOGRAPHY

Soviet Scientists Opposed to Dumping of Atomic Wastes in Oceans

Special studies of the temperature, salinity, and density of the waters, conducted by Soviet scientists, showed that free and rapid exchanges of the water in the oceans are fully possible and are not dependent on the depth of a locality. This finding was again pointed out by V. G. Bogorov, Corresponding Member of the Academy of Sciences USSR, in reiterating the opposition of Soviet scientists to the dumping of atomic wastes into the deep-water depressions of the oceans. Such dumping would inevitably lead to the contamination of the waters and animal and plant organisms, and in turn, also the fish existing therein. This position is in opposition to that held by many non-Russian scientists. ("The Ocean and Radioactive Wastes," by V. G. Bogorov, Corresponding Member Academy of Sciences USSR, Moscow, Sovetskaya Aviatsiya, 14 Jan 59, p 4)

East German Tide-Computing Machine

An article by the head of the scientific department of the Institute of Oceanology, Warnemuende, East Germany, on the design and operation of various tide-predicting machines of the world gives the following information on the third German tide-predicting machine, recently put in service in East Germany:

In the tide-predicting machine of the GDR, there are 34 tide drives, each of which weighs over 100 pounds. The total weight of the machine is about 8 tons. It consists of 32,000 individual parts, of which almost 17,000 are standard parts, 2,350 are roller bearings, and 1,300 are different gears. The machine took over 3 years to build; the design was done by an engineer named Below. The machine was built at VEB Lokomotivbau Karl Marx in Babelsberg; the precision mechanical parts were produced in VEB Geraete- und Reglerwerke (Instrument and Controller Works), Teltow, Plant 3, "Feinmechanik Babelsberg." VEB Rheinmetall, Soemmerda, produced the accessory electromagnetic-mechanical printing devices which record the final values for tides according to time and height. ("On the Construction of the Third German Tide-Computing Machine," by G. Sager; Berlin, Feingeraetetechnik, No 12, Dec 58, pp 555-559)

## VII. ARCTIC AND ANTARCTIC

### Station Vostok

A large portion of the scientific program of this station consists of observations in the field of geomagnetism, the ionosphere, and auroras. O. Kolomiytsev and P. Maysuradze, geophysicists, are recent university graduates. As all other members of the station, they are working for the first time in such difficult climatic conditions.

According to observations conducted by P. Mitin, engineer-meteorologist, the air temperature at the south geomagnetic pole varies between minus 22.4 degrees Centigrade in January and minus 87.4 degrees Centigrade in August.

The mean annual temperature of the air in the station area is minus 57-58 degrees Centigrade. The winds are usually westerly. The average wind velocity is 5 meters per second, and it sometimes reaches 35 meters. In June and July, i.e., at the height of the antarctic winter, there were snowstorms during which tons of snow were carried over one square meter in a horizontal direction during the period of one hour.

G. Shamray, engineer-aerologist, and M. Rybchenko, radar engineer, carry out daily vertical soundings of the atmosphere. At the south geomagnetic pole there are strong ground inversions. In the atmospheric layer from the ground surface to a height of 850 meters, the temperature increases sharply. The strongest inversion was noted in August; at an altitude of 860 meters, it was 38.9 degrees warmer than at the earth's surface.

Interesting observations have been made on the behavior of metals, fuel, and lubricants under low temperatures. As a result of extremely low temperatures, metal changes its structure and becomes coarse-grained and very brittle, fuel crystallizes, and lubricants freeze.

When the air temperature drops below minus 80 degrees Centigrade, it is sufficient to stay outdoors for only a few seconds to get one's face or hands frostbitten if they are not well protected.

B. Chernov, radioman, maintains steady radio contact with Mirnyy and other Soviet south polar stations. He is an experienced radio operator, who has worked many years in the Arctic, at the stations on Ostrov Rudol'fa, Ostrov Vize, and Ostrov Dikson. He was one of the three brave men who made a crossing on foot from Ostrov Gukera to Ostrov Rudol'fa over the hummocky ice of the straits and glaciers of Zemlya Frantsa Iosifa. In his spare time, Chernov establishes radio contacts with amateurs all over the world.

The remote-control and automatic equipment, self-recorders, and various other instruments require a continuous supply of electric power. The electric station operates on a 24-hour basis. -- V. Sidorov, chief of Station Vostok. ("A Year at the South Geomagnetic Pole"; Moscow, Vodnyy Transport, 1 Jan 59)

Station Sovetskaya

The Soviet polar scientists have conducted scientific research in the region of the pole of relative inaccessibility. The severe frost and the elevation of the ice sheet, which reaches 4,000 meters, create serious difficulties.

In the Antarctic fall, i.e., in March, April, and May, the average temperature of the air in the area of Sovetskaya was minus 61 degrees Centigrade. In the winter, the average temperature was minus 70 degrees Centigrade. The lowest temperature was recorded on 9 August -- minus 87 degrees. The temperature observations were made in a 42-meter hole drilled in the ice cover and showed that the annual mean temperature of the air in the area of Sovetskaya must be about minus 57 degrees Centigrade.

Despite heavy frosts, observations were conducted regularly. Under 80-degree temperatures, G. Mayevskiy, aerologist, and G. Malikov, radio technician, launched radiosondes, and V. Konstantinov, who is a physician by profession, conducted theodolite observations of the radiosondes in flight.

Together with a group of scientific associates of the Antarctic Expedition, V. Babarykin, chief of station Sovetskaya, conducted a 2-week cycle of complex observations at the pole of inaccessibility. The research included meteorology, actinometry, glaciology, and terrestrial magnetism. ("Where No Human Foot Has Stepped Before"; Moscow, Vodnyy Transport, 1 Jan 59)

Some Members of Fourth Antarctic Expedition

Aboard the expedition ship Lena, sailing to the Antarctic in November 1958, are a large number of young polar specialists.

N. M. Kovalevskiy, mechanical engineer, specialist for cross-country vehicles, will work in the transport group of the expedition. He is an "old hand," having taken part in the Second Antarctic Expedition; he was one of the leaders in the second sled-tractor train into the unexplored regions of Antarctica.

Another veteran of the Antarctic is A. P. Kapitsa, senior scientific associate. During the first expedition, he conducted ice studies. On his return to Moscow, he prepared a report on his collected materials. Recently Kapitsa defended his dissertation and received the title of Candidate of Geographical Sciences.

V. V. Gavrilov, a young doctor, is traveling to the Antarctic for the second time. His specialties are therapeutics, surgery, and stomatology.

Ye. Ya. Yevseyev, meteorologist, is also going to Antarctica for the second time. This time he will work not in Mirnyy, but at the new station, Lazarev.

Among members of the Fourth Antarctic Expedition are a number of Komsomols: M. A. Kanash, aviation technician; R. G. Skrynnikov, junior scientific associate and geophysicist; N. M. Komarov, mechanic and tractor driver; and S. B. Ukhov, A. V. Krasnushkin, and V. V. Viskov, junior scientific associates. ("Young Explorers of the Antarctic"; Moscow, Vechernyaya Moskva, 29 Oct 58)

Ob' Unloads in Mirnyy

After cutting its way through the ice for 5 days, the Ob' was finally moored to the edge of the fast ice, 3 kilometers from Mirnyy. The ship was unloaded 2 days sooner than had been anticipated.

Following the unloading, a new cargo from Mirnyy was delivered to the ship for loading and for transportation to the station Lazarev, which is to be established in the near future. ("Ob' in Mirnyy"; Moscow, Izvestiya, 14 Jan 59)

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